Know more about your gold ore!
Gold deposits currently being considered for exploitation are becoming increasingly lower in grade and higher in complexity and, in response, so are the extractive metallurgical processes.

It is therefore critical to obtain information on all factors that might affect eventual profitable mining and processing of the deposit.

Benefit from the integration of our services...
At ALS Metallurgy we are able to fully characterize gold ores through comprehensive programmes including multi-stage diagnostic leaching, pre-concentration, process mineralogy and other complementary testwork.

Our experts integrate quantitative process mineralogy with bankable metallurgy to provide critical information for process flowsheet development and optimisation.

Working together, our team of highly experienced mineralogists and metallurgists provide you with a complete understanding of how your ore will respond to extractive processes.

...throughout the life time of your project
When performed during the exploration and feasibility stages of the project, such information can identify and quantify key parameters that might influence the viability of a project. The information is incorporated into geometallurgical models and assists with reserve and resource estimations and with mine production planning.

Information on the deportment of the gold is also used during the design of gold recovery circuits and, when done routinely, ensures continued optimization of existing processes and the ongoing profitability of the mining operation.

Process mineralogical data on gold ores is also crucial during environmental assessment programmes and, in preparation for eventual mine closure, as part of any mine rehabilitation analysis.

We can add value throughout the life cycle of your gold project...
- Exploration
- Prefeasibility studies & feasibility studies
- Resource & reserve determination
- Geometallurgy
- Mine planning & production scheduling
- Concentrator process design & optimisation
- Pilot plant testwork support
- Plant control & troubleshooting
- Plant audits & monthly surveys
- Smelter management
- Environmental assessment programmes
- Mine rehabilitation analysis

Our leading mineralogical team
Our highly experienced team of mineralogists and technicians work closely with our dedicated gold metallurgists and pride themselves on providing the highest quality results and fast-turnaround times.

ALS Metallurgy’s integrated mineralogical approach using QEMSCAN®, X-ray diffraction, HyLogger™ and optical microscopy provides clients with an accurate, quantitative understanding of the mineralogical variability within a deposit.

Automated Mineralogical Analysis using the QEMSCAN® provides accurate, fast, repeatable, quantitative mineralogical analysis of core samples, process feed, concentrate and residue samples, and smelter products to maximise productivity and efficiency of gold exploration, process design and optimisation, mining, production and rehabilitation processes.
...provides you with critical mineralogical information

Process mineralogical studies include identification of the gold minerals (for example, size, shape, composition of the gold) and also the associated host rock minerals since their composition could have a significant effect on the efficiency of the extraction process and the overall viability of the operation.

We are able to characterise all gold-bearing grains larger than about 0.5µm in size and can discriminate between the gold species such as native gold, electrum, maldonite, calaverite, hessite, petzite, sylvanite, aurostibite, aurocuprite and others. This knowledge is important since gold alloyed with elements such as antimony, bismuth and tellurium and even silver is less soluble than native gold.

The importance of the identification of potentially deleterious minerals such as preg-robbers (for example, active carbon and pyrrhotite), environmentally undesirable elements (for example, arsenic and lead), and minerals that could potentially consume acid, alkali or oxygen should not be overlooked.

Apart from the full modal mineralogical analyses of the gold ore samples, we assist with the following:

- Prediction of leach parameters such as leach rates, acid consumption, acid generation and heat generation using quantitative mineralogical data.
- Elemental deportment of valuable, deleterious and penalty elements between minerals.
- Mineral liberation and locking analysis per size fraction with specific emphasis on surface exposure.
- Grain size and particle size data (down to less than 1µm).
- Mineral associations especially to characterise complex relationships between minerals that might influence leach behaviour.
- Textural information illustrating the complex relationships between the component minerals.
- When presented in tables and as digital particle maps, the data is a powerful communication tool during team discussions.
Metallurgical Solutions

ALS Metallurgy is part of the ALS Group, a diversified and global analytical laboratory and testing services company. ALS Metallurgy is the global leader in metallurgical testing and consulting services for mineral process flowsheet development and optimisation.

Extensive bench scale laboratory, large scale pilot plant facilities and expert metallurgists, provide mineral processing, hydrometallurgical, mineralogical and in-plant services to the global resources community.

Our metallurgical solutions are internationally recognised by the mining, engineering and financial sectors for all major commodities:

- Precious metals - gold, silver, platinum group metals
- Base metals - copper, cobalt, lead, zinc, molybdenum, manganese
- Iron ore - hematite, magnetite, goethite, itabirite
- Nickel - laterite & sulphide ores
- Uranium & thorium
- Rare earth minerals & other exotics
- Mineral sands
- Industrial minerals
- Tungsten & tin

ALS Metallurgy has an enviable reputation for delivering the highest quality extractive metallurgical testing service with accurate and timely data, expert support and a culture of safety and innovation.

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